

WHAT IS CLAIMED IS:

1. A method for stabilizing the structure and nucleic acids of at least one cell in a sample, wherein said method comprises:

(a) adding to a vessel containing the sample, a composition comprising an effective concentration of a substance capable of precipitating or denaturing proteins and capable of aiding in the infusion of said composition into said at least one cell;

(b) contacting said at least one cell in said sample with said composition;

(c) incubating said sample with said composition for an effective period of time and at an effective temperature; and

(d) obtaining said at least one cell with stabilized structure and nucleic acids in said sample.

2. The method of Claim 1 wherein said substance is selected from the group consisting of methanol, ethanol, propanol, isopropanol, butanol, acetone, dimethyl sulfoxide, ethylene glycol and polyethylene glycol.

3. The method of Claim 1 wherein said substance is methanol.

4. The method of Claim 1 wherein said substance is dimethyl sulfoxide.

5. The method of Claim 1 wherein said at least one cell is a prokaryote or eukaryote.

6. The method of Claim 1 wherein said at least one cell is a microorganism.

7. The method of Claim 1 wherein said nucleic acid is DNA.

8. The method of Claim 1 wherein said nucleic acid is RNA.

9. The method of Claim 8 wherein said RNA is ribosomal RNA.

10. The method of Claim 1 wherein said effective period of time is from about one to four days.

11. The method of Claim 1 wherein said effective temperature is room temperature.

12. The method of Claim 1 wherein said effective temperature is from about 0° to 40° C.

13. A method for stabilizing the structure and nucleic acids of at least one cell in a sample, wherein said method comprises:

(a) adding to a vessel containing the sample, a composition comprising an effective concentration of:

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- (i) a first substance capable of precipitating or denaturing proteins, comprising at least one alcohol or ketone; and
- (ii) a second facilitator substance to aid in the infusion of the first substance into said at least one cell;
- (b) contacting said at least one cell in said sample with said composition;
- (c) incubating said sample with said composition for an effective period of time and at an effective temperature;
- (d) obtaining said at least one cell with stabilized structure and nucleic acids in said sample.

14. The method of Claim 13 wherein said at least one alcohol or ketone is selected from the group consisting of methanol, ethanol, propanol, isopropanol, butanol and acetone.

15. The method of Claim 13 wherein said second substance is selected from the group consisting of dimethyl sulfoxide, ethylene glycol and polyethylene glycol.

16. The method of Claim 13 wherein said first substance is comprised of one alcohol or ketone.

17. The method of Claim 16 wherein said concentrations of said first and second substances in said composition are in a ratio of 4:1 (first substance : second substance).

18. The method of Claim 13 wherein said first substance is comprised of a first alcohol or ketone and a second alcohol or ketone.

19. The method of Claim 18 wherein said concentrations of said first and second substances in said composition are in a ratio of 2.5:2.5:5 (first alcohol or ketone : second alcohol or ketone : second substance).

20. The method of Claim 16 wherein said concentrations of said first and second substances in said composition are in a ratio of 1:1 (first substance : second substance).

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21. ~~The method of Claim 17 wherein said first substance is methanol and said second substance is dimethyl sulfoxide.~~

22. The method of Claim 19 wherein said first alcohol or ketone is methanol, said second alcohol or ketone is ethanol and said second substance is dimethyl sulfoxide.

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23. ~~The method of Claim 17 wherein said first substance is ethanol and said second substance is dimethyl sulfoxide.~~

24. The method of Claim 20 wherein said first substance is methanol and said second substance is dimethyl sulfoxide.

25. The method of Claim 13 wherein said nucleic acid is DNA.
26. The method of Claim 13 wherein said nucleic acid is RNA.
27. The method of Claim 26 wherein said RNA is ribosomal RNA.
28. The method of Claim 13 wherein said effective period of time is from about one to four days.
29. The method of Claim 13 wherein said effective temperature is room temperature.
30. The method of Claim 13 wherein said effective temperature is from about 0° to 40° C.
31. The method of Claim 13 wherein said at least one cell is a prokaryote or eukaryote.
32. The method of Claim 13 wherein said at least one cell is a microorganism.

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